

Caltech336

T E S S M T W T F S S M T W

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Caltech's carts ease campus burdens

Javier Marquez

They crisscross the campus, unfettered by speed limits and unaffected by the parking squeeze. Many don't have windows, much less doors; windshields are optional; seat belts are rare. They are often seen congregating in pods near the entrances to buildings, or parked singly, toolboxes split open to reveal their gleaming implements.

Where once Huffy 10-speeds ruled as the primary means of on-campus transportation, vehicles with names like Taylor-Dunn, Conroe, and Cushman now prevail. These days, utility carts, even golf carts, are the method of choice to get from point A to point B without breaking a sweat.

This is Caltech's fleet of utility vehicles and electric carts that haul workers, equipment, and the odd visitor across campus. Caltech's security force uses them as patrol vehicles and for parking enforcement duty. Some departments use them to ferry groups of visitors to distant offices. They're also handy for a quick trip to Caltech's farthest reaches. As the popularity of these industrial carts has surged, so has their number.

This rise has not gone unnoticed. In the spring of 2000, Dean of Students Jean-Paul Revel led a survey to determine exactly how many carts roam Caltech's paths and walkways. The results showed that there were 72 carts.

For years, these vehicles have played the all-important Ditch Day role of transporting undergrads on their stack-solving crusades. Along with the keys, students received a list of driving do's and don'ts. However, in the name of student safety, Revel banned the practice, to the chagrin of many students.

Since Revel's survey was completed, the number of carts on campus has risen.

"There are about 100 electric carts on campus, and Physical Plant has half," said Bill Irwin, director of Physical Plant. "They're used primarily to get tools and equipment to a job site and back quickly. They are small and they can handle our malls and paths."

Physical Plant is responsible for a vast
see Carts, page 6

Barish nominated to science board

Barry Barish, Caltech's Linde Professor of Physics, has been nominated to the National Science Board by President George W. Bush, the White House announced October 17.

The U.S. Senate must approve the eight new nominees. If accepted, Barish will help oversee the National Science Foundation and advise the president and Congress on a broad range of policy issues related to science, engineering, and education.

The 24-member board conducts studies, presents results and recommendations in reports and statements, and makes these documents available to the research and educational communities and the public. Meeting in Washington, D.C., at least five times a year, the board also publishes the biennial Science and Engineering Indicators.

A UC Berkeley graduate, Barish arrived at Caltech in 1963 and has been involved with some of the highest-profile projects in the world. He led one of the large detectors for the Superconducting Supercollider before the project was cancelled; searched for magnetic monopoles beneath Italy's Gran Sasso mountain; performed experiments at the Stanford Linear Accelerator Center; and is presently involved in the neutrino experiment inside Minnesota's Soudan Underground Mine.

He was also responsible for the experiment at Fermilab that provided definitive evidence of the weak neutral current, the linchpin of the electroweak theory for which Sheldon Glashow, Abdus Salam, and Steven Weinberg won the Nobel Prize.

Since 1997, Barish has directed the Laser Interferometer Gravitational-Wave
see Barish, page 6

"Voices" speakers promise to enlighten

Poets, writers, cartoonists, and other creative thinkers will descend on the Caltech campus this academic year—through the new Voices of Vision speaker series—to share with the Caltech community their unique ways of seeing the world.

"At Public Events, we wanted a series that would bring innovative thinkers to campus, something that would expose the audience to people who express themselves through different media," said Denise Nelson Nash, director of Caltech Public Events.

"We see this as a vital part of the vibrancy of this campus, bringing speakers who explore ideas in an inspiring fashion," she said. Each event will offer students a chance to interact with the

see Voices, page 6

Charlie kicks off campaign



Caltech's \$1.4 billion capital campaign officially kicked off with a gala dinner and dance last Friday on the north athletic field. Talk-show host Charlie Rose served as emcee for the weekend's events. More photos, page 6.

Proposals sought for Webcast project

So you were too busy grading problem sets and managed to miss every one of the 0.1 lectures. Or you had to cover the phones during commencement, and Alan Alda gave his speech without you.

Not to worry—you can view these events and more on the Web at the @Caltech Theater (<http://atcaltech.caltech.edu/theater>). Furthermore, the Caltech Webcast Project is looking to expand its offerings and provide an even wider range of online event coverage and resources. The goal is to produce 40 hours of streaming video programming this academic year, said Denise Nelson Nash, director of Caltech Public Events, who is coordinating the project.

In addition to covering major events such as the Michelin Distinguished Visitors Lecture, Watson Lectures, and Bioforum, the project is seeking proposals for additional content that promotes the Institute's educational objectives. Examples currently online include seminars, the ME72 robotics contest, and presentations such as the Caltech overview video shown to campus visitors, and an introduction to the Project MATH-EMATICS! program.

see Webcasting, page 6



Astronomer Jesse Greenstein dies

Jesse Greenstein, an astrophysicist whose many accomplishments included seminal work on the nature of quasars, died October 21, three days after falling and breaking his hip. He was 93.

A New York City native, Greenstein received a telescope from his grandfather at age 8, and soon was also experimenting with a prism spectroscope and other equipment. The spectroscope spurred a lifelong interest in identifying the composition of materials, leading to his becoming a worldwide authority on the evolution and composition of stars.

By 16, Greenstein had entered Harvard University, where he earned his bachelor's degree in 1929, his master's in 1930, and his doctorate in 1937. That same year, he won a two-year National Research Council Fellowship, with which he joined the University of Chicago's Yerkes Observatory at Williams Bay, Wisconsin. In 1939 he became part of the University of Chicago

see Greenstein, page 2

NewsBriefs



Retired JPL scientist John W. Lucas, looking up at the camera, tests out the new wind tunnel that was recently dedicated on campus and named after him. Funded by the Richard M. Lucas Foundation, the tunnel can generate wind speeds of up to 175 mph and will be used to test aerodynamic properties for research and commercial applications.

Personals

Welcome to Caltech

September

David Zito, entrepreneur in residence, engineering and applied science.

October

Orlando Arevalo, research assistant, Laser Interferometer Gravitational-Wave Observatory (LIGO) (Livingston, Louisiana); **Tan Benjakalyakorn**, property analyst, Property Services; **Max Berry**, associate, desktop support, Administrative Technology Center; **Charles Bordier**, research assistant I, LIGO (campus); **Sougato Bose**, postdoctoral scholar in physics; **Patrick Cahalan**, system analyst, Information Technology Services; postdoctoral scholars **Xavier Calmet**, physics, **Junhong Chen**, chemical engineering, **Emmanuelle Despagne**, chemistry, **Jonathan Gair**, physics, and **Stacey Kalovidouris**, chemistry; **Laurie Kovalenko**, associate scientist, planetary sciences; **Chungsok Lee**, postdoctoral scholar in physics; **David LeFay**, precision machinist, PMA/GPS Shop; **Sacha Malin**, postdoctoral scholar in biology; **Jeffery Martin**, senior postdoctoral scholar in physics; **Tod Pascal**, technical aide A, chemistry and chemical engineering; **Hongwu Ren**, postdoctoral scholar in astronomy; **Diana Salazar**, administrative secretary, Quantum Optics; **Michael Sutton**, postdoctoral scholar in biology; **Dennis Ugolini**, senior postdoctoral scholar in physics; **Hidehiro Yoshida**, visitor in physics.

Honors and awards

Richard Ellis, Steele Family Professor of Astronomy and director, Caltech Optical Observatories, has been elected a Fellow of the American Association for the Advancement of Science for his "seminal work in observational cosmology that has provided insight into the origin and evolution of galaxies and the distribution of the unidentified dark matter." A Fellow of the Royal Society, Ellis received his doctorate from the University of Oxford in 1974.

Carver Mead, Moore Professor of Engineering and Applied Science, Emeritus, is being inducted as a Fellow of the Computer History Museum in Mountain View, California, along with industry pioneers Charles Geschke, John Warnock, and the late John Cocke. The chairman and founder of Foveon, Inc., Mead is being recognized for his "many pioneering contributions in solid-state electronics." He is a graduate of Caltech's class of 1956 and received his PhD from the Institute in 1960.

David Levy to join financial-aid drive

David Levy, director of financial aid at Caltech, has been invited to join L.A. Mayor James Hahn, in partnership with the California Student Aid Commission (CSAC), to assist students in obtaining Cal Grants and filling out their Free Application for Federal Student Aid (FAFSA) forms. The effort is to be called Free Cash for College, and the goal of the program is to remove financial barriers and make aid available to as many students as possible.

Beginning on Thursday, November 7, and continuing through Saturday, November 9, students will be bused to the L.A. Convention Center from all over Southern California for a college fair that will include a workshop for exploring financial-aid opportunities, organized under the guidance of Levy and other experts from Southland academic institutions. The Free Cash for College event will take place on February 1 and 2 and will be closely coordinated with a similar program, College Goal Sunday, a statewide effort being repeated from last year. Levy will coordinate 500 volunteers at over 50 locations in Southern California and more than 300 locations statewide, who will help students fill out financial-aid application forms.

According to L.A. Deputy Mayor Joy Chen, Levy "was a leader in last year's CSAC effort, and his name has come up repeatedly as having been one of the most important participants, assisting in recruiting volunteers and developing materials." Last year saw an increase of nearly 20 percent in the number of students receiving Cal Grants, and drive participants hope this year to further increase the number of students attending college with the help of the grants.

Wilkie serving as FCC chief economist

While largely unnoticed by most of us, the Federal Communications Commission looms large in our media-driven lives, regulating devices like cell phones, pagers, and televisions. Now **Simon Wilkie**, a Caltech senior research associate in economics, is responsible for providing independent, nonpartisan advice on various regulatory issues as the FCC's new chief economist. Appointed by Michael Powell, FCC chair (and son of Secretary of Defense Colin Powell), Wilkie began his position in July, and is currently on sabbatical from the Institute.

Wilkie is an internationally recognized scholar with extensive communications industry experience. A Caltech faculty member since 1995, he previously was a technical staff member and a postdoctoral fellow at Bell Communications Research (BellCore). He is also on the editorial board of the *Journal of Public Economic Theory* and has published widely on spectrum auctions, game theory, and telecommunications regulation. Wilkie received his undergraduate degree at the University of New South Wales in 1982, and his MA (1988) and PhD (1990) in economics at the University of Rochester.

Exploring new ways of telling the past

Caltech professor of history **Robert Rosenstone** has published a new book that tells through a variety of voices the story of his own European ancestors as they journeyed first to Canada and then to the United States. Titled *The Man Who Swam Into History*, the book avoids the traditional clichés of the immigrant saga and presents instead in a series of scenes the conflicts and pleasures of a small group of quirky characters. Along the way, the book continually and humorously questions the veracity of its own assertions in its recounting of the past. An author of works of biography and history, Rosenstone has served as an editor for the *American Historical Review* and *Rethinking History: The Journal of Theory and Practice*, among other academic publications, and as a consultant for several movies and documentaries. He has published in the *New Republic*, the *Progressive*, the *New York Times*, the *Los Angeles Times*, the *Guardian* (Manchester), and the *Times* (of London), and portions of his new book appeared in the *Partisan Review* and the *Michigan Quarterly Review*. His works have been translated into many languages, and his book of essays, *Visions of the Past: The Challenge of Film to Our Idea of History*, won the Book of the Year award from the international journal *Film Historia*.

AVS leaves CPE, joins DMC, ITS

Audio Visual Services, formerly part of Caltech Public Events under Public Relations, has merged with the Digital Media Center, a unit of Information Technology Services. Under the new arrangement, AVS manager Guy Colville reports to Wayne Waller, manager of the Digital Media Center.

According to Dan Meiron, associate provost for information and information technology, "It became clear to [Director of Information Technology Services] Rich Fagen, [Director of Public Events] Denise Nelson Nash, [Vice President for Public Relations] Bob O'Rourke, and myself that the movement of AVS toward digital technology is inevitable and that the lines of responsibility between the two groups will become hazy over time," he said.

For example, he said, last year Provost Steve Koonin initiated a series of Webcasts of faculty lectures, and has since provided funds to expand the Webcast program in order to showcase Caltech to online visitors (see related article on page 1). Meiron noted that AVS had worked closely with the DMC on the Webcast series and that "it is expected that this type of activity will increase over time," particularly in light of the new capital campaign.

"We believe [the change] will be beneficial to DMC, AV, PR, and to the campus as a whole, since the activities are now integrated and will benefit from Wayne Waller's leadership in digital media," Meiron said. "Our view is that we hope this is the beginning of a central organization that can serve faculty, development, staff, students, and administration alike when they are in need of digital media services."

Greenstein, from page 1

astrophysics faculty, and during the war years did military research in optical design at Yerkes. He also worked at McDonald Observatory, operated by the University of Chicago and the University of Texas, before coming to Caltech to organize a graduate program in optical astronomy in conjunction with Palomar Observatory's new 200-inch Hale Telescope.

The Caltech astronomy program quickly became the premier program of its kind in the world, with Greenstein serving as executive officer for astronomy from 1964 to 1972. In that time, he spent more than 1,000 nights observing at Palomar and other observatories, and also took up radio astronomy in 1955. He retired from the Caltech faculty in 1980, but remained active in research for many years.

Greenstein's interests centered on the physics of astronomical objects. In addition to stellar composition, he also studied the synthesis of chemical elements in stellar interiors and the physical processes of radio-emitting sources; worked with Caltech colleague Maarten Schmidt on the high redshift of quasars in 1963; demonstrated that quasars are quite compact objects; and discovered more than 500 white dwarfs. In later years, he studied white dwarfs' magnetic fields and luminosities and worked on ultraviolet spectroscopy with data obtained from the IUE satellite.

During his long career, Greenstein was elected to the National Academy of Sciences and the American Academy of Achievement, was named California Scientist of the Year, and was awarded NASA's Distinguished Public Service Medal, the Royal Astronomical Society's Gold Medal, and Harvard's Centennial Medal. Active in establishing the National Radio Astronomy Observatory, he served as chair of the board of the Association of University Research in Astronomy and of the National Research Council's 1970 *decadal review of astronomy* (for which the Greenstein Report was issued), and on the National Academy of Sciences' committee on science engineering and public policy.

He is survived by two sons, Peter and George. Naomi Kitay Greenstein, his wife of 68 years, died earlier this year. The Greensteins were noted for the warmth and hospitality they extended to astronomers from all over the world.

Waser passes away

Jürg Waser, retired professor of chemistry, died of congestive heart failure at his home in La Jolla in August. He was 85. Known for his memorable lecturing style and infamous pop quizzes, as well as his work in X-ray crystallography, he was synonymous with freshman chemistry for a generation of Caltech students. He was described as a dedicated teacher and supporter of the SURF program. Born in 1916 in Switzerland, Waser attended the University of Zürich before coming to Caltech and completing a PhD in chemistry with Linus Pauling in 1944. He remained as a mathematics instructor, research fellow, and Noyes Fellow until 1948, when he returned to the University of Zürich. Waser came back to Caltech in 1958 as professor of chemistry, and for 12 years taught the Chem 1 general course. He was active in the American Crystallographic Association and other professional societies, and wrote numerous articles. Retiring in 1975, Waser stayed active writing textbooks, continuing in research, and traveling. He is survived by his wife, Irma; three children, Peter, Nickolas, and Katherine; a stepson, Ray Weiss (Caltech BS 1964); and a grandson.

November 4–10, 2002

M T W T F S S

Monday, November 4

Astronomy Tea Talk
106 Robinson, 4 p.m.—“Spectroscopic Confirmation of a Population of Luminous Galaxies with Evolved Stellar Populations at z~3,” Pieter van Dokkum, postdoctoral scholar in astronomy, Caltech. Information: www.astro.caltech.edu/~cc/tea_talks.

Geology and Planetary Sciences Seminar
155 Arms, Robert Sharp Lecture Hall, 4 p.m.—“Carbon on Mars: Reservoirs, Processes, and Implications for Bio-signatures,” Laurie Leshin, associate professor, department of geological sciences, Arizona State University. Information: www.gps.caltech.edu.

High-Energy Physics Seminar
469 Lauritsen, 4 p.m.—“Direct CP Violation in Untagged B-Meson Decays,” Susan Gardner, department of physics and astronomy, University of Kentucky. Information: www.theory.caltech.edu/people/helen/seminar1.html.

Mathematics Colloquium
151 Sloan, 4:15 p.m.—“Surfaces in Finite Covers of 3-Manifolds: The Virtual Haken Conjecture,” Nathan Dunfield, Benjamin Peirce Assistant Professor of Mathematics, Harvard University. Information: <http://www.math.caltech.edu/events/colloq.html>.

Tuesday, November 5

LIGO Science Seminar
351 West Bridge, LIGO Science Conference Room, 11 a.m.—Topic to be announced. Peter Shawhan, LIGO Laboratory, Caltech. Information: www.ligo.caltech.edu.

Caltech Library System Presents: A Quick Review of HUMSS Information Resources
Sherman Fairchild Library, multimedia conference room, noon to 1:30 p.m.—Review the content and use of subscription databases for the humanities and social sciences. Registration: <http://library.caltech.edu/learning/form.htm>.

Thesis Seminar
151 Crellin, 1:30 p.m.—“Impact-Ionization Mass Spectroscopy of Cosmic Dust,” Daniel Austin, graduate student in chemistry, Caltech.

Institute for Quantum Information Seminar
74 Jorgensen, 3 p.m.—Topic to be announced. John Watrous, assistant professor and Canada Research Chair in Quantum Computing, department of computer science, University of Calgary.

Caltech/JPL Association for Gravitational-Wave Research Seminar Series
114 E. Bridge, 4 p.m.—“CMB Polarization and Future Polarimeters,” James Bock, JPL.

Carnegie Observatories Colloquium Series
William T. Golden Auditorium, 813 Santa Barbara Street, 4 p.m.—“OH Megamasers: Luminous Tracers of Galaxy Mergers, Starbursts, and Massive Black Holes,” Dr. Jeremy Darling, Carnegie Observatories. Refreshments, 3:30 p.m.

Wednesday, November 6

Mathematical Physics Seminar
351 Sloan, noon—“A Carleson-Type Theorem for a Cantor Group Model of the Scattering Transform,” Professor Christoph Thiele, department of mathematics, UCLA. Information: www.math.caltech.edu/events/mathphys.html.

Astronomy Colloquium
155 Arms, Robert Sharp Lecture Hall, 4 p.m.—“Black Holes of All Masses: The Globular Cluster/Galaxy Connection,” Karl Gebhardt, assistant professor, astronomy department, University of Texas at Austin. Information: www.astro.caltech.edu/~gma/colloquia.html.

Environmental Science and Engineering Seminar
142 Keck, 4 p.m.—“Greenhouse Warming and the Impact of Sea-Level Rise on Water Resources on the Coastal Plain of the Gulf Coast, USA,” Anne Carey, assistant professor, department of geological sciences, Ohio State University.

William Bennett Munro Memorial Seminar
237 Baxter, 4 p.m.—“Literary Revivals, Colonial Aftermaths: Ireland and Northern Ireland 1900–2000,” Seamus Deane, University College Dublin, and Keough Professor of Irish Studies, Notre Dame University. Refreshments.

Neurobiology Seminar
24 Beckman Labs, 4 p.m.—“Regulation of Boundary Formation by Ephrins; Eph and FGF Receptors,” David Wilkinson, Division of Developmental Neurobiology, National Institute for Medical Research, London.

Pasadena’s Contributions to Astronomy
Beckman Institute auditorium, 7:30 p.m.—“Beyond the Milky Way,” Dr. John Mulchaey, Carnegie Observatories. This lecture series is being held in conjunction with the Pasadena Museum of History’s current exhibition, “Pasadena Looks at the Universe.” Museum members, \$15; nonmembers, \$20. Tickets: Apple Farrar, 577-1660, ext. 10, or info@pasadenahistory.org. Information: www.pasadenahistory.org.

Earnest C. Watson Lecture
Beckman Auditorium, 8 p.m.—“The Voyager Journeys to Interstellar Space,” Edward Stone, Morrisroe Professor of Physics, Caltech. Admission is free. Information: 395-4652, 1 (888) 2CALTECH, or events@caltech.edu. Individuals with a disability: 395-4688 (voice) or 395-3700 (TDD). Visit Public Events at www.events.caltech.edu.

Thursday, November 7

Caltech Library System Presents: Online Resources for Electrical Engineering and Computer Science
Sherman Fairchild Library, multimedia conference room, 2 p.m. to 3:30 p.m.—A quick review on how to access electrical engineering and computer information resources, including IEEE, INSPEC, ACM, NCSTRL, and CaltechCSTR. Registration: <http://library.caltech.edu/learning/form.htm>.

Geoclub Seminar
151 Arms, Buwalda Room, 4 p.m.—“Climate, Tectonics, and Topographic Evolution of Active Orogenic Belts,” Todd Ehlers, postdoctoral scholar in geology, Caltech.

William Bennett Munro Memorial Seminar
315 Baxter, 4 p.m.—“The Architecture of Yoknapatawpha: The Built Environment of William Faulkner’s World,” Thomas Hines, professor of history and architecture, UCLA. Refreshments.

Physics Research Conference
201 E. Bridge, 4 p.m.—“Fast Light, Slow Light,” Peter Milonni, Laboratory Fellow, Los Alamos National Laboratories. Refreshments, 108 E. Bridge, 3:45 p.m. Information: www.pma.caltech.edu/~physcoll/PhysColl.html.

Friday, November 8

Theoretical Astrophysics Including Relativity (TAPIR) Seminar
114 E. Bridge, 2 p.m.—“Small-Scale Structure in Lens Galaxies,” Charles Keeton, NASA Hubble Fellow, department of astronomy and astrophysics, University of Chicago.

Fluid Mechanics Seminar
101 Guggenheim Lab, Lees-Kubota Lecture Hall, 3 p.m.—“Non-Premixed Jet Flame Instabilities: From Hydrodynamic to Thermo-Diffusive Modes,” Paul Papas, Swiss Federal Institute of Technology (EPFL). Information: www.galcit.caltech.edu/Seminars/Fluids/CurrentFluids/index.html.

Inorganic-Organometallics Seminar
151 Crellin, 4 p.m.—“Stoichiometric C-H and Catalytic C-Si Bond Activation Reactions of Platinum(II) Alpha-Diimine Complexes,” Alan Heyduk, postdoctoral scholar in chemistry, Caltech.

Stone to highlight Voyager journeys

Twenty-five years ago, two Voyager spacecraft were launched to explore Jupiter, Saturn, Uranus, Neptune, and beyond. This year, JPL is celebrating the past quarter-century of discoveries made by the spacecraft, and Edward Stone, former JPL director and Caltech’s Morrisroe Professor of Physics, will present some of those intriguing findings in “The Voyager Journeys to Interstellar Space.” Part of the Watson Lecture Series, the talk will take place on Wednesday, November 6, at 8 p.m. in Beckman Auditorium.

The Voyagers revealed dozens of distinctive worlds, with jet streams and giant storms in the planets’ atmospheres, volcanoes on the moon Io, a deep atmosphere with organic raindrops on Titan, a frozen nitrogen polar cap on Triton, and rings that appear to be debris from shattered moons. The two spacecraft are now continuing their journeys as the first interstellar probes, searching for the outer boundary of the heliospheric bubble surrounding the sun that marks the beginning of interstellar space.

No tickets are required for the Watson Lectures. A minimum of 700 seats will be available on a first-come, first-served basis, starting at 7:30 on lecture evenings. For more information, contact Public Events at 1 (888) 2-CALTECH, (626) 395-4652, or events@caltech.edu, or visit www.events.caltech.edu. Individuals with a disability can call 395-4688 (voice) or 395-3700 (TDD).

November 11–17, 2002

M T W T F S S

Monday, November 11

Astronomy Tea Talk

106 Robinson, 4 p.m.—Topic to be announced. Enrico Ramirez-Ruiz, Institute of Astronomy, Cambridge. Information: www.astro.caltech.edu/~cc/tea_talks.

Geology and Planetary Sciences Seminar

155 Arms, Robert Sharp Lecture Hall, 4 p.m.—"Land-Atmosphere Interactions in Beringia Over the Last 21 Ka: Investigations Using Regional and Global Climate Models," Amanda Lynch, associate professor, program in atmospheric and oceanic sciences, University of Colorado, Boulder. Information: www.gps.caltech.edu.

Ernest H. Swift Lecture

22 Gates Annex, 4 p.m.—"Class I Ribonucleotide Reductases: Radical Initiation by Long Range Proton Coupled Electron Transfer?," JoAnne Stubbe, Novartis Professor of Chemistry, MIT. Refreshments, 3:30 p.m.

Applied and Computational Mathematics Colloquium

101 Guggenheim Lab, Lees-Kubota Lecture Hall, 4:15 p.m.—"Adaptive Finite Element Methods," Ron DeVore, professor of mathematics, University of South Carolina. Refreshments, 3:45 p.m. Information: www.acm.caltech.edu/colloq.shtml.

Tuesday, November 12

Caltech Women's Science Symposium

Beckman Institute, 9 a.m. to 4:30 p.m.—Sponsored by WEST (Women in Engineering, Science, and Technology), this two-day symposium (continued on November 13, 9 a.m. to 4:30 p.m.) will highlight the achievements of Caltech female scientists, from undergraduates to faculty. All members of the Caltech community are invited to attend. Breakfast will be served at 8:30 a.m. Visit www.its.caltech.edu/~westclub for up-to-date information on speakers, schedules, and locations.

LIGO Science Seminar

351 West Bridge, LIGO Science Conference Room, 11 a.m.—Topic to be announced. Alan Weinstein, professor of physics, Caltech.

Inorganic-Electrochemistry Seminar

147 Noyes, Sturdivant Lecture Hall, 2 p.m.—"Bleomycins: Model for Single Molecule Mediate Double-Strand Cleavage," JoAnne Stubbe, Novartis Professor of Chemistry, MIT.

Carnegie Observatories Colloquium Series

William T. Golden Auditorium, 813 Santa Barbara Street, 4 p.m.—"Starburst and Merger Histories of QSO Host Galaxies," Dr. Gabriela Canalizo, Lawrence Livermore National Laboratory. Refreshments, 3:30 p.m.

Chemical Physics Seminar

147 Noyes, Sturdivant Lecture Hall, 4 p.m.—"The Chemical Physics of Light Harvesting," Graham Fleming, Calvin Distinguished Professor of Chemistry, UC Berkeley.

General Biology Seminar

119 Kerckhoff, 4 p.m.—"On Molecular Autonomous Agents: A Possible Physical Definition of Life," Stuart Kauffman, Bios Group Inc., Santa Fe, New Mexico.

James R. and Shirley A. Kliegel Lecture in Engineering and Applied Science

Ramo Auditorium, 4 p.m.—"Fractals, From Art to Art: Through Mathematics, Finance, Engineering, and the Sciences," Benoit Mandelbrot, Sterling Professor of Mathematical Science, Yale University. Refreshments, 3:45 p.m.

Wednesday, November 13

Neurobiology Seminar

100 Broad Center, noon—"Genetic Models of Anxiety and Depression," René Hen, associate professor, Center for Neurobiology and Behavior, Columbia University.

Astronomy Colloquium

155 Arms, Robert Sharp Lecture Hall, 4 p.m.—"LIGO, LISA, and the Numerical Simulation of Gravitational-Wave Sources," Kip Thorne, Feynman Professor of Theoretical Physics, Caltech.

Ulric B. and Evelyn L. Bray Seminar

25 Baxter, 4 p.m.—"Universal Laws of Complex Networks," John Doyle, professor of control and dynamical systems, electrical engineering, and bioengineering, Caltech. Refreshments.

Environmental Science and Engineering Seminar

142 Keck, 4 p.m.—Topic to be announced. Dr. William Collins, Scientist III, Climate and Global Dynamics Division, National Center for Atmospheric Research.

Pasadena's Contributions to Astronomy

Beckman Institute auditorium, 7:30 p.m.—"The Search for Habitable Worlds," Dr. Victoria Meadows, astrobiologist, JPL. This lecture series is being held in conjunction with the Pasadena Museum of History's current exhibition, "Pasadena Looks at the Universe." Museum members, \$15; nonmembers, \$20. Tickets: Apple Farrar, 577-1660, ext. 10, or info@pasadenahistory.org. Information: www.pasadenahistory.org.

Thursday, November 14

Caltech Library System Presents: Patents

Sherman Fairchild Library, multimedia conference room, 2 to 3:30 p.m.—A quick review of the patenting process, searching for patents and patent equivalents, legal status issues, and current awareness techniques. Registration: <http://library.caltech.edu/learning/form.htm>.

Biophysics Lecture Series

153 Noyes, Sturdivant Lecture Hall, 4 p.m.—"Single Molecule Nanoscale Rulers," Professor Shimon Weiss, department of chemistry and biochemistry, UCLA. Refreshments, 3:45 p.m.

Geoclub Seminar

151 Arms, Buwalda Room, 4 p.m.—Topic to be announced. Chad Saltikov, postdoctoral scholar in geobiology, Caltech.

Physics Research Conference

201 E. Bridge, 4 p.m.—"Cold Atom Clocks and Fundamental Tests," Christophe Salomon, Ecole Normale Supérieure, Paris. Refreshments, 108 E. Bridge, 3:45 p.m. Information: <http://www.pma.caltech.edu/~physcoll/PhysColl.html>.

Friday, November 15

Center for Integrative Multiscale Modeling and Simulation (CIMMS) Workshop

Beckman Institute auditorium, 9:45 a.m. to 5:45 p.m.—"Molecular Modeling and Computation: Perspectives and Challenges," a two-day workshop (continued on November 16 from 9 a.m. to 5 p.m.) to assess the current and future standing of molecular modeling and the associated computational challenges. Leading researchers from around the world will give their perspectives and results. Registration: 395-4105 or cimms@caltech.edu. Information: www.cimms.caltech.edu/workshops_dir/cimms_ipam.html. (The workshop is complementary to IPAM Workshop IV, "Modeling and Simulation for Materials," November 19–22.)

Fluid Mechanics Seminar

101 Guggenheim Lab, Lees-Kubota Lecture Hall, 3 p.m.—"PIV Measurements of the Structure of Drag-Reduced Turbulence and the Mechanisms of Polymer Drag Reduction," Christopher White, postdoctoral researcher, mechanical engineering department, Stanford University. Information: www.galcit.caltech.edu/Seminars/Fluids/CurrentFluids/index.html.

Inorganic Organometallics Seminar

151 Crellin, 4 p.m.—"Controlling Metal Ion Reactivity Through Non-Covalent Interactions," Cora MacBeth, senior research fellow in chemistry, Caltech.

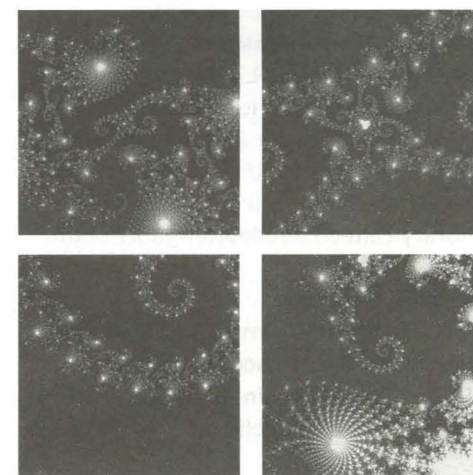
Kellogg Seminar

Lauritsen Library, 4 p.m.—"Limits on CP Violation from Electric Dipole Moments," Michael Romalis, Princeton University.

Science, Ethics, and Public Policy Seminar

25 Baxter, 4 p.m.—"The Zeitgeist of Discovering the Neuronal Correlates of Consciousness," Christof Koch, Troendle Professor of Cognitive and Behavioral Biology and professor of computation and neural systems. Refreshments. Information: www.hss.caltech.edu/ses/index.html.

Fractal geometry's father to speak



Benoit Mandelbrot, who founded fractal geometry and is Sterling Professor of Mathematical Science at Yale University, will speak in Ramo Auditorium on November 12.

CampusEvents

Monday, November 4

Baby Furniture and Household Equipment Pool

234 S. Catalina, 10 a.m. to 1 p.m.—Loans of kitchen and household necessities and baby furniture are made to members of the Caltech community. Information: 584-9773.

Tuesday, November 5

Photoshop Class

New Media Classroom, 363 S. Hill Avenue, 10 a.m. to noon—Learn the important functions of Photoshop, such as selection, layers, image enhancement, and correct file formats. The emphasis is on research images, but the information is useful to anyone working with images. This two-day class will continue on Thursday. Registration: carolynp@caltech.edu. Information: <http://morel.caltech.edu/classes/workshops.html>.

Caltech Tai Chi Club

Winnett lounge, 7 p.m.—Meets Tuesdays and Fridays weekly. Sessions are free. Information: www.its.caltech.edu/~taichi/.

Volleyball

vs. University of La Verne, 7:30 p.m.

Wednesday, November 6

Baby Furniture and Household Equipment Pool

234 S. Catalina, 10 a.m. to 1 p.m.—Loans of kitchen and household necessities and baby furniture are made to members of the Caltech community. Information: 584-9773.

Men’s Water Polo

vs. University of La Verne, 4 p.m.

Men’s Soccer

at Claremont-Mudd-Scripps, 7 p.m.

Thursday, November 7

Photoshop Class

New Media Classroom, 363 S. Hill Avenue, 10 a.m. to noon—A continuation of Tuesday’s class. Information: <http://morel.caltech.edu/classes/workshops.html>.

Volleyball

at Claremont-Mudd-Scripps, 7:30 p.m.

Voices of Vision Series

Beckman Institute auditorium, 8 p.m.—“Politics and Culture in Modern and Contemporary Ireland,” Seamus Deane, University College Dublin, and Keough Professor of Irish Studies at Notre Dame University. Admission is free. Information: 395-4652, 1 (888) 2CALTECH, or events@caltech.edu. Individuals with a disability: 395-4688 (voice) or 395-3700 (TDD). Visit Public Events at www.events.caltech.edu.

Friday, November 8

Men’s Water Polo

at Whittier College, 4 p.m.

Caltech Tai Chi Club

Winnett lounge, 7 p.m.—Meets Tuesdays and Fridays weekly. Sessions are free. Information: www.its.caltech.edu/~taichi/.

Opening Night of Double Infidelity

Dabney Lounge, 8 p.m.—Theater Arts at Caltech presents *Double Infidelity (La double inconstance)* by Marivaux, translation by Oscar Mandel, professor of literature, Caltech. Tickets and information: 395-4652, 1 (888) 2CALTECH, or events@caltech.edu. Individuals with a disability: 395-4688 (voice) or 395-3700 (TDD). Visit Public Events at www.events.caltech.edu.

Voices of Vision Talk Postponed

“What’s the Color of Funny? Race, Society, and Comic Strips,” with cartoonist Aaron McGruder, which was originally scheduled for this date in the Caltech Presents calendar for 2002–03, has been postponed until February 4, 2003.

Saturday, November 9

Men’s Water Polo

vs. University of Redlands, 7 p.m.

Double Infidelity

Dabney Lounge, 8 p.m.—Theater Arts at Caltech presents *Double Infidelity (La double inconstance)* by Marivaux, translation by Oscar Mandel, professor of literature, Caltech. Tickets and information: 395-4652, 1 (888) 2CALTECH, or events@caltech.edu. Individuals with a disability: 395-4688 (voice) or 395-3700 (TDD). Visit Public Events at www.events.caltech.edu.

Folk Music Society Presents Cosy Sheridan

Winnett lounge, 8 p.m.—The singer-songwriter will make one of her infrequent West Coast appearances at Caltech. Admission is \$12 for adults and \$5 for children and Caltech students. Tickets and information: 395-4652, 1 (888) 2CALTECH, or events@caltech.edu. Individuals with a disability: 395-4688 (voice) or 395-3700 (TDD). Visit the Folk Music Society at www.its.caltech.edu/~folkmusi.

Sunday, November 10

Women’s Introductory and Intermediate Self-Defense Class

Steele House (carriage house), 10 a.m. to 6 p.m.—Participants are introduced to the techniques involved in self-defense, including a variety of hands-on techniques, and will have an opportunity to practice on a padded assailant. Registration: 395-3221 or wcenter@cco.caltech.edu.

Double Infidelity

Dabney Lounge, 2 p.m.—Theater Arts at Caltech presents *Double Infidelity (La double inconstance)* by Marivaux, translation by Oscar Mandel, professor of literature, Caltech. Tickets and information: 395-4652, 1 (888) 2CALTECH, or events@caltech.edu. Individuals with a disability: 395-4688 (voice) or 395-3700 (TDD). Visit Public Events at www.events.caltech.edu.

Monday, November 11

Baby Furniture and Household Equipment Pool

234 S. Catalina, 10 a.m. to 1 p.m.—Loans of kitchen and household necessities and baby furniture are made to members of the Caltech community. Information: 584-9773.

Beginners’ Hip-Hop Dance Class

Braun Gym, multipurpose room, 10 p.m.—Beginners’ hip-hop, professionally taught. The trial class costs \$5; cost for the full term is \$20 for Caltech students and \$30 for others. No special clothing or shoes are required. Open to all who have a valid gym membership. Sponsored by the Caltech Dance Troupe.

Tuesday, November 12

Premiere Video Editing Class

New Media Classroom, 363 S. Hill Avenue, 10 a.m. to noon—Learn about digitizing video for use on your computer, including basic editing techniques, adding titles, and using effects and transitions. Output your final project to tape or to file. This two-day class will continue on Thursday. Registration: carolynp@caltech.edu. Information: <http://morel.caltech.edu/classes/workshops.html>.

Women’s Introduction to Self-Defense

Steele House (carriage house), 6 to 10 p.m.—Participants are introduced to the techniques involved in self-defense, including a variety of hands-on techniques. Registration: 395-3221 or wcenter@cco.caltech.edu.

Caltech Tai Chi Club

Winnett lounge, 7 p.m.—Meets Tuesdays and Fridays weekly. Sessions are free. Information: www.its.caltech.edu/~taichi/.

Amnesty International Letter Writing

Athenaeum Rathskeller, 7:30 p.m.—An informal meeting at which we write letters on human-rights abuses around the world. All are welcome. Refreshments. Information: (818) 354-4461 or lkamp@lively.jpl.nasa.gov.

Intermediate Jazz Dance Class

Braun Gym, multipurpose room, 9:30 p.m.—Intermediate jazz dance, taught by a professional instructor. The trial class costs \$5; cost for the full term is \$20 for Caltech students and \$30 for others. No special clothing or shoes are required. Open to all who have a valid gym membership. Sponsored by the Caltech Dance Troupe.

Wednesday, November 13

Baby Furniture and Household Equipment Pool

234 S. Catalina, 10 a.m. to 1 p.m.—Loans of kitchen and household necessities and baby furniture are made to members of the Caltech community. Information: 584-9773.

Interactive Classroom Whiteboard Technologies

New Media Classroom, 363 S. Hill Avenue, 10 a.m.—A demonstration of interactive whiteboards and two technologies that can add a new dimension to teaching: the SMART overlay touch board and the e-beam electronic “pen” with which to write and record on any whiteboard. Registration: 395-3420 or carolynp@caltech.edu. Information: <http://morel.caltech.edu/classes/demos.html>. This class will be repeated at noon.

Laboratory Safety 101

118 Keith Spalding Building, 3 p.m.—This course is designed to prepare incoming researchers to work in a laboratory at the Institute. Issues include laboratory organization, emergencies, injuries, general laboratory safety, and more. Space is limited. Please call 395-6727 or e-mail Andrea.Acosta@caltech.edu to reserve a place.

Thursday, November 14

Premiere Video Editing

New Media Classroom, 363 S. Hill Avenue, 10 a.m. to noon—A continuation of Tuesday’s class. Information: <http://morel.caltech.edu/classes/workshops.html>.

Reel Women Film Series: Righteous Babes

Second-floor common area of the Center for Student Services, north wing, 8 p.m.—Intercutting performance footage with interviews, this movie deals with the role of female recording artists in the 1990s and their influence on modern women. Snacks provided.

Friday, November 15

Caltech Tai Chi Club

Winnett lounge, 7 p.m.—Meets Tuesdays and Fridays weekly. Sessions are free. Information: www.its.caltech.edu/~taichi/.

Double Infidelity

Dabney Lounge, 8 p.m.—Theater Arts at Caltech presents *Double Infidelity (La double inconstance)* by Marivaux, translation by Oscar Mandel, professor of literature, Caltech. Tickets and information: 395-4652, 1 (888) 2CALTECH, or events@caltech.edu. Individuals with a disability: 395-4688 (voice) or 395-3700 (TDD). Visit Public Events at www.events.caltech.edu.

Saturday, November 16

Men’s Soccer

vs. alumni, 11 a.m.

Beginning Ballet Class

Braun Gym, multipurpose room, 1 p.m.—Free class taught by experienced members of the Caltech Dance Troupe. All experience levels are invited. No special clothing or shoes are required.

Caltech-Occidental Symphony Concert

Ramo Auditorium, 8 p.m.—The Caltech-Occidental Symphony, under the leadership of Allen Robert Gross and featuring mezzo-soprano Alma Mora Ponce, will perform works by Wagner, Montsalvatge, and Tchaikovsky.

Double Infidelity

Dabney Lounge, 8 p.m.—Theater Arts at Caltech presents *Double Infidelity (La double inconstance)* by Marivaux, translation by Oscar Mandel, professor of literature, Caltech. Tickets and information: 395-4652, 1 (888) 2CALTECH, or events@caltech.edu. Individuals with a disability: 395-4688 (voice) or 395-3700 (TDD). Visit Public Events at www.events.caltech.edu.

Sunday, November 17

Double Infidelity

Dabney Lounge, 2 p.m.—Theater Arts at Caltech presents *Double Infidelity (La double inconstance)* by Marivaux, translation by Oscar Mandel, professor of literature, Caltech. Tickets and information: 395-4652, 1 (888) 2CALTECH, or events@caltech.edu. Individuals with a disability: 395-4688 (voice) or 395-3700 (TDD). Visit Public Events at www.events.caltech.edu.

Amnesty International Book Discussion Group

Vroman’s Bookstore, 695 E. Colorado Boulevard, 2nd floor, 6:30 p.m.—Book title to be announced. All are welcome. Registered members of the group can buy the book at a discount from Vroman’s.

Iraq, terrorism on the table

The Social Activism Speaker Series kicks off its fourth year with a timely talk by Scott Ritter, former chief weapons inspector for the United Nations Special Commission (UNSCOM) in Iraq. “Understanding the Roots of Terrorism: Iraq As Case Study,” a free public lecture, will take place on Wednesday, November 13, at 8 p.m. in Ramo Auditorium. (Location is tentative; to confirm, please check <http://atcaltech.caltech.edu/calendar> or contact Greg Fletcher at gregf@caltech.edu or ext. 6163.)

The controversial Ritter resigned his post in 1998, charging that the United States was purposefully obstructing completion of the UNSCOM mission. In recent months he has criticized the Bush administration’s policies, arguing that UN inspectors destroyed 90 to 95 percent of Iraq’s weapons of mass destruction in their seven years there, and that it would be impossible for Iraq to have restocked them undetected in the four years since.

Coordinated by the Caltech Y, the Social Activism Speaker Series is made possible by contributions from the President’s Office, Student Affairs, Caltech Auxiliary and Business Services, the Alumni Association, the Diversity Initiative Fund, the Mellon Foundation, the Graduate Student Council, Jack and Edith Roberts, and the Associated Students of Caltech. Other speakers this year will be Adam Shapiro and Huwaida Arraf, cofounders of the International Solidarity Movement, on January 8, and Theodore Postol, MIT professor and critic of the nuclear missile defense program, on April 2.

Can’t get enough of 336?

Find current and past issues online at <http://pr.caltech.edu/periodicals/336>.

Voices, from page 1

speaker either before or after the presentation.

The list of confirmed speakers is diverse. Inaugurating the series on November 7 will be Seamus Deane, an Irish poet who has written *Reading in the Dark*, a well-received novel set in the Northern Ireland town of Derry. A professor of Irish studies at Notre Dame, he also writes on the politics of national partition and the subsequent devastating separation and loss that befell a nation's people, such as in Kashmir, Palestine, and his native Ireland.

In the winter, the next speaker will be Aaron McGruder, a cartoonist who uses his daily strip "The Boondocks" to pose tough questions about race, class, and politics in America. His strip records the adventures of a group of characters, African American youngsters, from Chicago's inner city. Hip-hop culture clashes with suburbia when they are transplanted to the white suburbs, leading to telling observations. His talk, "What's the Color of Funny? Race, Society, and Comic Strips," is set for February 4.

An unabashed maven of the science-fiction TV series and movie franchise *Star Trek*, Lawrence Krauss examines that universe's physical laws with a physicist's eye. In "The Physics of Star Trek," Krauss, a physicist at Case Western Reserve University, will use the space adventure not only to begin exploring the possibilities of time travel and warp drives, but to delve into the equally fascinating world of modern physics. He will visit Caltech on February 26.

In the opera *El Niño*, the story of the Nativity is given an innovative multicultural treatment. On March 8, in advance of the opera's presentation by the Los Angeles Philharmonic Opera, composer John Adams, conductor Esa-Pekka Salonen, and director Peter Sellars will discuss their cutting-edge opera. Drawing on Spanish, English, and Latin sources, with texts ranging from those of pre-Christian prophets to female modern-day writers, the story of the birth of Jesus becomes one of motherhood as well.

Recently added to the roster of series speakers is Marilyn Chin, a poet and an instructor in the master of fine arts program at San Diego State University, who will visit Caltech on April 30. Born in Hong Kong, Chin considers herself an activist poet, one who sees the great potential of poetry to act as a catalyst to elicit change in the world. Chin will speak on April 30.

Tickets to the events and the latest information about this extraordinary speaker series can be obtained by calling (626) 395-4652 or by visiting Caltech Public Events at www.events.caltech.edu.

Webcasting, from page 1

All proposals should be sent to Nelson Nash at dnn@caltech.edu or mail code 332-92. Vice Provost David Goodstein will be in charge of reviewing proposals for academic programming. The minimum lead time requested is four weeks ahead of the event. "We need to be able to schedule a technical crew and to make sure the room is suitable for video recording," Nelson Nash said, explaining that some classrooms are too small to allow proper distance for filming, or their lighting or sound can't be controlled.

Describing the history of the Webcast project, Goodstein and Nelson Nash said that discussion began about two years ago on how to take advantage of emerging Web technologies. Since then, the project has been in a pilot phase, testing advances such as synchronized multimedia integration language, or SMIL (pronounced "smile"), which allows easy authoring of interactive multimedia presentations. "Using SMIL, we can have lecturers on one screen and their presentation materials on a larger screen alongside or next to them, with very clear resolution," said Nelson Nash.

Now that the capability has been proven, she said, the question is "How do we populate the @Caltech Theater with features of broader interest?" By expanding the programming, she said, "there are so many different audiences we can reach, like prospective students and faculty, alumni, and the community."

The Webcast program is a joint effort of Digital Media Services, which provides audiovisual and recording services; Electronic Media Publications, which publishes the streaming video online; the Vice Provost's Office; and Public Relations. "One nice thing about Caltech is that this kind of seamless collaboration between departments is possible," said Goodstein.

Barish, from page 1

(LIGO) project, a National Science Foundation-funded collaboration between Caltech and MIT that aims to demonstrate the existence of gravitational waves, predicted long ago by Einstein but thus far only indirectly detected. The LIGO project also is striving to pioneer a new type of astrophysical observation by studying exotic objects such as colliding black holes, supernovae, and neutron-star and black-hole interactions.

Created by Congress in 1950, the National Science Board has an official mission to "promote the progress of science; advance the national health, prosperity, and welfare; and secure the national defense."

Carts, from page 1

number of campus services, from utilities and engineering to shipping and receiving, all the shops, and maintenance functions.

Perhaps it is due to the recent proliferation of carts that Irwin has taken the unusual step of imposing a moratorium on utility vehicle purchases.

"Physical Plant can get one only when another breaks down," he said. "We're only replacing carts, not buying additional ones."

It seems that with an increase in the number of these vehicles, the problems are magnified. Not only do drivers cut corners on pathways meant for foot traffic, flattening flowerbeds and forming ruts in the landscaping, the carts are sometimes driven too zealously. Irwin said that people have complained of excessive speed and near collisions.

Nobody is proposing anything as rash as a ban on these electric vehicles. They are simply too practical, and Caltech is large enough to make them a necessity. They are also a relatively inexpensive boon to productivity on campus.

Unlike gasoline-powered trucks, all that the majority of Caltech's carts need is a driver, an overnight charge at the nearest electrical outlet, and sufficient p.s.i. in their little rubber wheels. With an average top speed of 10 miles per hour, a full charge can last for about two hours of nonstop service.

As Bob Molina, a sales manager with Taylor-Dunn, will tell you: "They're quiet, they don't pollute, and they're user-friendly."

They are also inexpensive when compared to a conventional pickup. A new, basic model of the top-selling Burdenmaster goes for about \$5,000. But, just like you'll find at the car dealership, there exists a world of options.

"You can get customized seating, cabs, special boxes, doors, special lighting, even special paint," Molina said. Such extras add to the vehicle's capacity and security features, but they also raise its price to about \$15,000.

Physical Plant's moratorium has had an effect. In his estimation, Molina said that Caltech's demand for industrial vehicles from the Anaheim-based manufacturer peaked about two or three years ago. The existing fleet will have to age gracefully.

Still, it seems that the demand for Burdenmasters, Loadmasters, and EZ-Gos remains steady. At an institute as decentralized as Caltech, any office with the people-moving needs, and the money, can dial up a sales rep like Molina and order one.

But for some managers on campus, this is a moot point. "We don't go out much onto campus," said Brian Spritzer, manager of Caltech's Credit Union, which is located on Caltech's outskirts. "Everybody comes here."

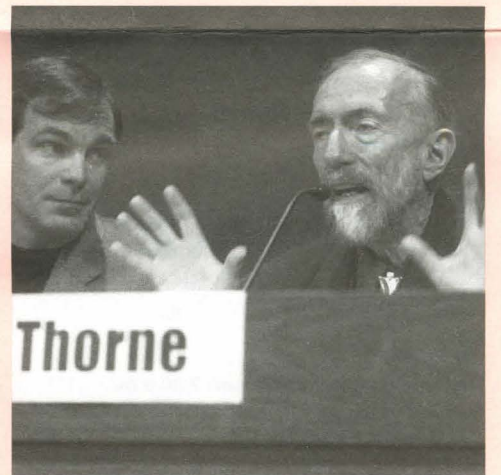
Fete, discussion launch campaign



Caltech trustee and alum Gordon Moore (left) and his wife, Betty, were presented a scale model of the Mars land rover by JPL director Charles Elachi. Moore also had an asteroid named for him. Earlier, the pathway from Wilson to Holliston Avenues was dedicated as Moore Walk in honor of the couple.



Guests cut loose on the dance floor to classic swing and R&B sounds.



Professors Andrew Lange (left) and Kip Thorne skipped sleeping in Saturday morning to take part in a panel discussion, "A Celebration of Caltech Science." Moderated by Rose, the event drew more than 600 people to Beckman Auditorium.

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